

F-8387

MAY 28 2009

Ser. No. 10/509,817

**IN THE CLAIMS:**

Please replace the claims with the claims provided in the listing below wherein status, amendments, additions and cancellations are indicated.

1. *(Previously Presented)* Method for producing modified flours or modified starch-containing products from a ground or comminuted raw material product, predominantly containing starch, the method comprising the following steps:
  - a) mixing and wetting at least one comminuted, starch-containing raw material product with water and/or water vapor and optionally further additives by moving the raw material product in a mixing chamber of a preconditioner during a first preconditioner residence time,
  - b) allowing the water and/or the water vapor to act on the at least one starch-containing raw material product by moving the raw material product in an action chamber of the preconditioner during a second preconditioner residence time to obtain a preconditioned mixture,
  - c) extruding the preconditioned mixture of water and raw material product, preconditioned in the mixing chamber and the action chamber in steps a) and b), manipulating the extruding process variables of temperature, pressure, water content

F-8387

Ser. No. 10/509,817

of the preconditioned mixture, mechanical energy introduced during extruding, and the residence time of the mixture in the extruder so that an at least partial plasticization and/or gelatinization of the raw material product takes place during extruding, wherein said raw material product is converted to a conveyable mixture, containing a modified starch, takes place during extruding, and

- d) pelletizing the conveyable mixture and dry grinding the obtained pellets to an intermediate product, containing modified starch,

wherein the intermediate product, obtained by pelletizing in step d), is agglomerated by:

- e) mixing and wetting the intermediate product, obtained in step d), with a fluid and, optionally, other additives by moving the intermediate product in a mixing chamber of an agglomerator during a first agglomerator mixing residence time, and

- f) allowing the fluid to act on the powdery to grainy intermediate product by moving the intermediate product in an action chamber of the agglomerator during a second agglomerator residence time, so that agglomerates are formed from the particles of the intermediate, containing the modified starch, wherein.

the preconditioner, in which steps a) and b) are carried out, and the

F-8387

Ser. No. 10/509,817

agglomerator, in which steps e) and f) are carried out, each have a mixing chamber above and connected to an action chamber, each of the chambers having a separate rotor shaft having radially protruding conveying elements for moving the intermediate product in the mixing chamber and in the action chamber, which rotor shafts extend along the respective chambers and which rotate about their longitudinal axes.

2. *(Cancelled)* The method of claim 1, wherein the preconditioner, in which steps a) and b) are carried out, and the agglomerator, in which steps e) and f) are carried out, each have a mixing chamber above an action chamber, which are connected with one another, each chamber having a rotor shaft for moving the intermediate product in the mixing chamber and in the action chamber, which extends along the respective chamber and which rotates about its longitudinal axis and has radially protruding conveying elements.

3. *(Previously Presented)* The method of claim 1, wherein the preconditioner and the agglomerator have the same construction.

4. *(Previously Amended)* The method of claim 1, wherein the residence time of the product in the mixing chamber during step e) is about 0.2 to 5 seconds.

5. *(Previously Presented)* The method of claim 1, wherein the residence

F-8387

Scr. No. 10/509,817

time of the product in the action chamber during step f) is about 10 seconds to 15 minutes

6. *(Previously Presented)* The method of claim 1, wherein the mixing chamber is filled to the extent of about 1 to 5% with the intermediate product, a fluid, and, optionally, other additives and the action chamber is filled with intermediate product to the extent of about 25 to 75% with the intermediate product, a fluid and, optionally, other additives.

7. *(Cancelled)*

8. *(Previously Presented)* The method of claim 4, wherein the pressure in the mixing chamber and the action chamber is atmospheric pressure and the temperature of the chambers in each case is between ambient temperature and about 98C.

9. *(Previously Presented)* The method of claim 1, wherein a combination of several fluids, selected from the group consisting of water, water vapor, sugar solutions and edible oil, is metered in to wet either or both of the starch-containing raw material or the intermediate product.

F-8387

Ser. No. 10/509,817

10. (*Previously Presented*) The method of claim 9, wherein the fluid or fluids is/are atomized when metered in.

11. (*Previously Presented*) The method of claim 1, wherein the agglomerates, obtained in step f), are classified according to size.

12. (*Previously Presented*) The method of claim 11, the classification takes place in a sifter.

13. (*Previously Presented*) The method of claim 11, wherein a fraction of the agglomerates, which exceed a specified maximum agglomerate size, initially is supplied to a comminuting device, and subsequently, once again is supplied to the agglomerator.

14. (*Previously Presented*) The method of claim 11, wherein a fraction of the agglomerates, which are smaller than a specified minimum agglomerate size, once again is supplied to the agglomerator.

15. (*Previously Presented*) The method of claim 13, wherein a fraction of the agglomerates, which are smaller than the maximum agglomerates size and/or larger than the minimum agglomerates size, is collected as end product.

F-8387

Ser. No. 10/509,817

the shape of a horizontal cylinder, the axis axis of rotation of the shaft extending along the axis of the cylinder.

23. (*Cancelled*)

24. (*Currently Amended*) The method of claim 1 [[2]], wherein the capacity of the action chamber is about 1.5 times to 10 times of the mixing chamber.

25. (*Previously Presented*) The method of claim 1, wherein the fluid, used in step e) for wetting the intermediate product and in step f) for acting on the intermediate product, contains at least water vapor and/or water.

26. (*Withdrawn*) Installation for producing modified flours or modified, powdery to grainy, especially finely grained, starch-containing products from a ground or comminuted raw material product, predominantly containing starch the installation comprising:

a preconditioner with a mixing chamber for mixing and wetting the at least one comminuted, starch-containing raw material product with water and/or water vapor as well as optionally further additives and an action chamber for permitting the water and/or water vapor to act on

F-8387

Ser. No. 10/509,817

the at least one raw material product,

an extruder for extruding the preconditioned mixture, containing water and the raw material product and emerging from the mixing chamber and the action chamber, the extruder having a pelletizing device for pelletizing the mixture emerging from the extruder,

a mill for grinding the pellets dry into a powdery to grainy intermediate product, and

an agglomerator for agglomerating the powdery to grainy intermediate product,

wherein the agglomerator comprises:

a mixing chamber for mixing and wetting the powdery to grainy intermediate product, obtained in the mill, with a fluid, and an action chamber for allowing the fluid to action the powdery to grainy intermediate product.

27. (*Withdrawn*) The installation of claim 26, wherein the preconditioner

F-8387

Ser. No. 10/509,817

and/or the agglomerator each have a mixing chamber above an action chamber, which are connected with one another, each chamber having a rotor shaft, which extends along the respective chamber and is provided with tools around the shaft.

28. *(Withdrawn)* The installation of claim 26, wherein the precondition has the same construction as the agglomerator.

29. *(Withdrawn)* The installation of claim 26, wherein the mixing chamber essentially has the shape of a horizontal cylinder, the axis of rotation of the shaft extending along the axis of the cylinder.

30. *(Withdrawn)* The installation of claim 26, wherein the action chamber essentially has the shape of a horizontal cylinder, the axis of rotation of the shaft extending along the axis of the cylinder.

31. *(Previously Presented)* Modified flour, comprising agglomerates, which are produced from a ground or comminuted, predominantly starch-containing raw material product, according to the method of claim 1.

32. *(Previously Presented)* The modified flour of claim 31, wherein the agglomerates range in size essentially from about 200  $\mu\text{m}$  to 5 mm.

F-8387

Ser. No. 10/509,817

33. *(Previously Presented)* The method of claim 1, wherein said ground or comminuted raw material product, predominantly containing starch includes starch or flours from grains or tubers, selected from the group consisting of wheat, rye flour, corn flour, potato flour, tapioca flour, and their mixtures.

34. *(Previously Presented)* The method of claim 4, wherein the residence time of the product in the mixing chamber during step e) is about 0.3 to 2 seconds.

35. *(Previously Presented)* The method of claim 5, wherein the residence time of the product in the action chamber during step f) is about 15 seconds to 60 seconds.

36. *(Previously Presented)* The method of claim 13, wherein said comminuting device comprises an impact mill.

37. *(Previously Presented)* The method of claim 11, wherein a fraction of the agglomerates, which exceed a specified maximum agglomerate size, initially is supplied to a comminuting device, and subsequently, together with the product obtained in step d), once again is supplied to the agglomerator.

F-8387

Ser. No. 10/509,817

38. (*Previously Presented*) The method of claim 11, wherein a fraction of the agglomerates, which are smaller than a specified minimum agglomerate size, together with the product obtained in step d), once again is supplied to the agglomerator.

39. (*Previously Presented*) The method of claim 17, wherein said further additives are selected from the group consisting of flavors, spices, coloring materials, emulsifiers, and acids.

40. (*Previously Presented*) The method of claim 20, wherein the mixing chamber is driven at a rate of about 700 rpm.

41. (*Previously Presented*) The method of claim 24, wherein the capacity of the action chamber is about twice to five times that of the mixing chamber.

42. (*Withdrawn*) Installation for producing modified flours or modified, powdery to grainy, especially finely grained, starch-containing products from a ground or comminuted raw material product, predominantly containing starch, using the method of claim 1, the installation having the following parts or machines:

a preconditioner with a mixing chamber for mixing and wetting the at least one comminuted, starch-containing raw material product with

F-8387

Ser. No. 10/509,817

water and/or water vapor as well as optionally further additives and an action chamber for permitting the water and/or water vapor to act on the at least one raw material product,

an extruder for extruding the preconditioned mixture, containing water and the raw material product and emerging from the mixing chamber and the action chamber, the extruder having a pelletizing device for pelletizing the mixture emerging from the extruder,

a mill for grinding the pellets dry into a powdery to grainy intermediate product and

an agglomerator for agglomerating the powdery to grainy intermediate product,

wherein the agglomerator comprises:

a mixing chamber for mixing and wetting the powdery to grainy intermediate product, obtained in the mill, with a fluid, and an action chamber for allowing the fluid to action the powdery to grainy intermediate product.

F-8387

Ser. No. 10/509,817

43. (*Withdrawn*) The installation of claim 26, wherein the mixing chamber for mixing and wetting the powdery to grainy intermediate product, obtained in the mill, with a fluid also mixes further additives.

44. (*Previously Presented*) The modified flour of claim 31, wherein the starch-containing raw material product includes starch or flour from grain or tubers selected from the group consisting of wheat, rye flour, corn flour, potato flour, tapioca flour, and their mixtures.

45. (*Previously Presented*) The modified flour of claim 32, wherein the agglomerates range in size essentially from 500  $\mu\text{m}$  to 2mm.